1211971

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August 16, 2004

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APPLICATION NUMBER: *60/496,116*
FILING DATE: *August 19, 2003*
RELATED PCT APPLICATION NUMBER: *PCT/US04/24074*

Certified by

Jon W Dudas

Acting Under Secretary of Commerce
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PTO/SB/16 (02-01)
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

Express Mail Label No. EV 307983284 US

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
David Jay	Duffield	Indianapolis, Indiana USA
Mark Alan	Schultz	Carmel, Indiana USA

☒ *Additional Inventors are being named on the next separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

THEATRE IDENTIFICATION SYSTEM

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☐ Customer Number [ ] → *Place Customer Number Bar Code Label here*

OR *Type Customer Number here*

☒ Firm or Individual Name	JOSEPH S. TRIPOLI, THOMSON MULTIMEDIA LICENSING INC.				
Address	PATENT OPERATIONS.				
Address	P. O. BOX 5312				
City	PRINCETON	State	NJ	ZIP	08543-5312
Country	USA	Telephone	609-734-6805	Fax	609-734-6888

ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages* 5 ☐ CD(s), Number [ ]

☐ Drawing(s) *Number of Sheets* 1 ☐ Other (specify) [ ]

☐ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check or money order is enclosed to cover the filing fees

FILING FEE AMOUNT ($)

☒ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 07-0832 — 160

☐ Payment by credit card. Form PTO-2038 is attached.

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: ____.

Respectfully submitted,

SIGNATURE Francis A. Davenport

Date August 19, 2003

REGISTRATION NO. (*if appropriate*) 36,316

TYPED or PRINTED NAME FRANCIS A. DAVENPORT

Docket Number: PU 030248

TELEPHONE 609 734-6805

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

PROVISIONAL APPLICATION COVER SHEET

Additional Page

PTO/SB/16 (02-01)
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Docket Number	PU030248	Type a plus sign (+) inside this box →	+

INVENTOR(S)/APPLICANT(S)

Given Name (first and middle [if any])	Family or Surname	Residence (City and either State or Foreign Country)
Michael Alan	Sterling	Woodland Hills, California USA

Number 2 of 2

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FEE TRANSMITTAL for FY 2003

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT ($) 160

Complete If Known	
Application Number	N/A
Filing Date	HEREWITH
First Named Inventor	David Jay Duffield et al.
Examiner Name	N/A
Group / Art Unit	N/A
Attorney Docket No.	PU030248

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 07-0832

Deposit Account Name: THOMSON *multimedia* Licensing Inc.

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27

2. ☐ Payment Enclosed:

☒ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	160

SUBTOTAL (1) ($) 160

2. EXTRA CLAIM FEES

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20 ** =	0	X		=	0
Independent Claims		-3 ** =	0	X		=	0
Multiple Dependent				X		=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1,440	218	720	Extension for reply within fourth month	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive – unavoidable	
141	1,280	241	640	Petition to revive – unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17 (q)	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	
				Other fee (specify) ____	

*Reduced by Basic Filing Fee Paid SUBTOTAL (3) ($) 0

SUBMITTED BY

Complete *(if applicable)*

Name (Print/Type)	Francis A. Davenport	*Registration No. Attorney/Agent)*		*Telephone*	609-734-6805
Signature	Francis A. Davenport			*Date*	August 19, 2003

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THEATRE IDENTIFICATION SYSTEM

Theft of new movie releases often occurs concurrently with an initial public showing, usually as a result of a camcorder recording of the presentation. At times theft can occur prior to the public release. Methods exist to mark release prints intended for public exhibition to assist in the identification of the film print and the theatre in which the theft occurred. However, the current system marks and identifies the reel of film, and not the theater. Shipping databases, etc. are used to track the theater to which the film was sent, but errors in the database are possible. Furthermore, a single reel of film may be used at multiple theaters over the life of the movie. What is required is an ability to identify the specific theater, date and time at which the program theft occurred.

SUMMARY OF THE INVENTION

An inventive system identifies and dates specific theaters and thereby complements the marking of individual release print reels. The advantageous system employs 'flashed' light sources, selectable in color, to encode a screen number, theater location, date and time for subsequent analysis from a recorded pirated copy.

A further advantage of this optical marking method is the ability to 'mark' non-release prints when shown in screening rooms or editing facilities. Since this advantageous optical marking arrangement is performed within the theater, rather than on the print, there is no potential problem with 'marking' an inter positive or IP print that may be subsequently used as a print master.

In a first embodiment, a secondary projector, often used to show advertising and auxiliary material prior to the feature presentation, is employed to superimpose, concurrently with the feature presentation, short duration patterns of colored dots. These dots are encoded with the date, time and location and are projected at predetermined intervals, for example, every 20 minutes. The projector can for example be powered up in a 'dowsed' mode that produces no light. The dowsing is then removed to project a black image with a pattern of dots, then the projector is turned off. However, such an arrangement is readily defeatable by actions in the projection booth.

A second embodiment can employ a light source behind a rotating disk containing a pattern of dots. The dot pattern would define the theater location, and a clock motor would rotate one or more disks to provide time information. For example, the light source is 'flashed' for approximately 100mS every 15 minutes. However, like the first

embodiment this arrangement is also easily defeatable by illicit actions in the projection booth.

A third, preferred embodiment is depicted in FIGURE 1 which shows a projection booth 110 with projector Pj adjacent to a projection theater 100 with perforated screen 120. In this arrangement a controlled light source 200, (Id) is located behind a perforated projection screen 120 (Sc), which is typically used in projection theaters 100. The controlled light source 200 has several illuminators or light sources Ls capable of illumination in selectable colors. For example, LED, LCD, low power incandescent, or neon bulbs, are controlled to flash in selected colors, coded patterns of light, for example at 15 minute intervals. The coded patterns define the theater location, date and time. The controlled light panel 200 is located behind the perforated screen and is powered by a battery backed up AC power supply. The device runs continuously regardless of the theater's usage.

This third method has several advantages over the first two embodiments. The controlled light source 200 can be physically located in a position such as to preclude or deter intervention by program pirates wishing to inhibit, obscure or circumvent its operation. In addition the lamps/ illuminators Ls do not create a black level shift in the viewed image which can occur with concurrent front projection, nor do they require a delaying warm-up period. Furthermore, the amount of power used by controlled light source 200 is very small, for example an optimized design can provide battery backed up operation for several hours following an AC supply interruption.

The location of the controlled light source behind the light permeable screen 1250 advantageously permits the intensity and or color of incident projected screen illumination to be sensed. Thus, by detecting screen brightness, light source 200 can adaptively modify the brightness and color of the theater identification to mitigate the contradictory requirements of durably marking the pirated copy formed by the image capture device Ic, whilst obviating or minimizing any audience distraction.

In an experimental arrangement a lap top personal computer was used to run, under Windows control, a proprietary custom application named 'sixshooter.exe'. The application formed and flashed 6 'dots' on the computer screen with programmable intervals and durations. The flashing dots were encoded with both time and a "screen identification number". This low optical power, controlled light source was employed behind a perforated screen during a movie presentation with the movie and PC generated identification recorded with a camcorder. Subsequent analysis of the recorded images

revealed the experimentally generated dots and thereby validated the viability of the identification system.

The screen illumination intensity sensor Cs can take the form of a device which responds the average screen brightness. Based on how much light is projected onto the screen, the intensity of the flashed signal can be changed. In this way the Id marker flash can be bright enough to be visible in a white scene area, but can be rendered unobjectionable during a black scene. In a further arrangement the screen intensity can be sensed with a frame imaging camera sensor capable of imaging screen exit rays 150. The camera image signal is processed provide a near real time spatial screen map of projected image intensity. This screen intensity map can indicate locations color and intensity to adaptively control the identification data generated by the light sources Ls of device 200. Ideally the picture rate of camera Cs is sufficiently rapid and integration time sufficiently short that one projector shutter opening is captured by camera Cs to enable the incident image intensity to be captured and a screen intensity map established to provide optimal Id flash locations and intensity during the subsequent exposures of the current film frame. Camera Cs can be considered to be a high frame rate imaging device with an exceptional low spatial resolution. The high imaging rate advantageously allows a near real time adaptation of light source Ls intensity in accordance with that of the projected image brightness.

FIGURE 2A illustrates an exemplary light emitting surface of controlled light source 200. The exemplary arrangement of FIGURE 2A shows 16 light sources Ls and light sensor Cs lit by rays 150. The individual light sources Ls are selectable in color and controllable in intensity. FIGURE 2B illustrates, in a detailed view, an alternative arrangement where the central, common sensor Cs of FIGURE 2A, is replaced by a plurality of sensors. Each sensor is associated with an individual light source to provide adaptive control in accordance with the intensity of screen exit rays 150 incident on the sensor. The sensor is mounted, for example, at the base of a matte black tube to reduce sensor contamination by light from light source Ls.

FIGURE 3 depicts a exemplary frame imaging camera sensor capable of imaging screen exit rays 150. The camera video is processed to produce 16 exemplary areas in which incident screen illumination is assessed to determine a predominate color and to provide an adaptive brightness control of individual light sources Ls. In exemplary FIGURES 2 and 3 the number and spatial position of light sources Ls may be advantageously related to similar spatial locations sensed by sensor Cs. Whilst this linear

relationship assists understanding there is no specific requirement for direct mapping of sensor spatial locations to light sources.

In a further inventive aspect controlled light source 200 is advantageously capable of remote control, for example, to enable/disable operation of the light source system. In this way the device can be activated with illicit copies of projected movies marked for identification when the rights owner desires use of the security Id service. However, if Id marking system is not desired it can be disabled. Such control can be accomplished using the same light sensor as described for adaptively controlling the Id intensity. A digital data stream can be projected at sensor Cs of light source 200 to provide remote control. For example, this control arrangement can be implemented using a projector that presents screen advertising, as depicted in FIGURE 1 by projector Pa. This projector can be supplied with display material, for example, advertising material from a computer controlled digital image store, video juke box or the like. In addition this computer controlled image source can be supervised, controlled and updated via a network connection. This network control connection can provide real time remote control data Ctrl1 which is projected to control operation of the light source system 200 thereby reducing a requirement for supervision by service personnel. This arrangement for film and theatre screen identification can be enabled or disabled by remote control, substantially instantaneously and surreptitiously. Alternatively control can be implemented using a short piece of 35 mm film projected onto the screen.

In a further alternative arrangement service personnel can initiate remote of the light source by means of a programmed device Rc such as a hand carried flashlight or strobe light for delivering control data Ctrl2. Furthermore an IR or RF remote control device akin to that of a TV control system can also be utilized.

The control digital data stream can carry commands for a given serial number unit or screen identifier, and can program the desired functional operation. The following are exemplary commands,

"Keep alive" programs the unit to continue periodic, continuous marking for a predetermined time period (e.g. 2 weeks) before terminating and entering a quiescent condition.

"Shut down"- stops the unit from marking and enters a standby condition.

"Remember" store in non volatile memory occurrences of incident screen light during a non-Id signaling "Shut down" mode.

"Change location"- programs in a given screen ID to be marked.

"Set time/date"- allows date and time setting of the unit.

In yet a further inventive arrangement, when unit 200 is 'refreshed' or interrogated by an exemplary remote control device, a further command "Dump" allows unit 200 to report, via an output port such as an IR or RF transmitter or light sources Ls, various data and or anomalous occurrences since a prior interrogation. For example, one anomaly would be a long period of time with AC power removed. A further anomaly can represent a long period of time without images projected on the screen, as determined by sensor Cs. Such an anomaly can be legitimate if the screen is not used frequently, however in a commercially active theater, such data is indicative of an obscuration of the screen illumination sensor Cs.

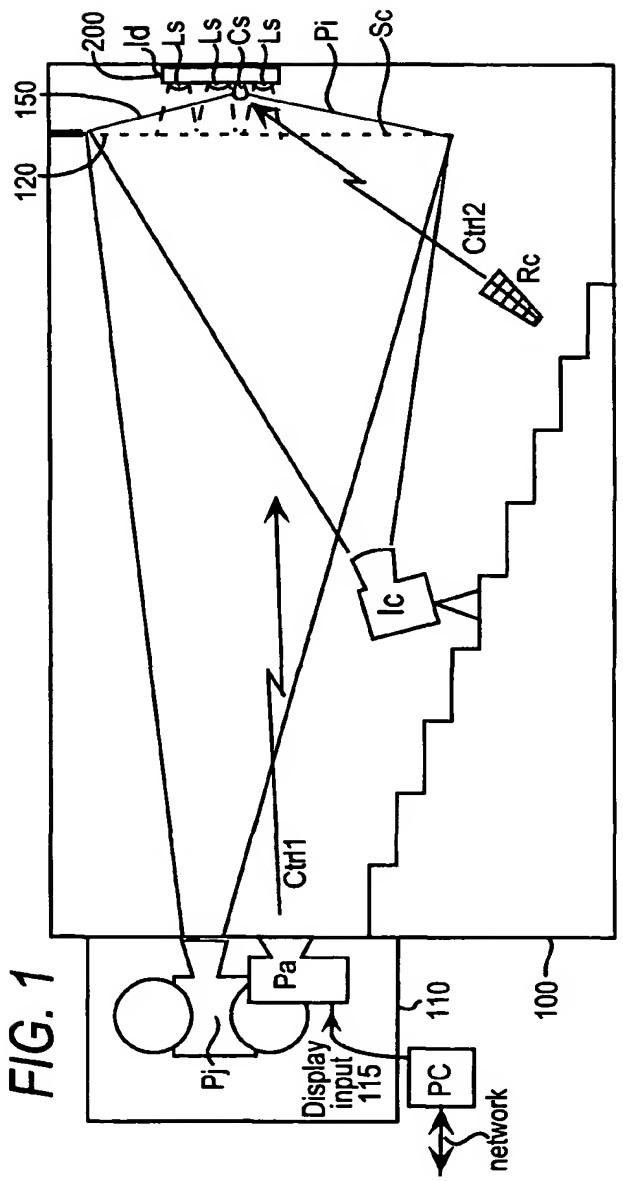

FIG. 1

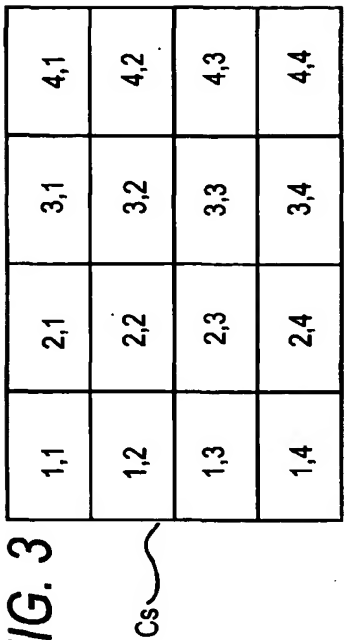

FIG. 3

FIG. 2B

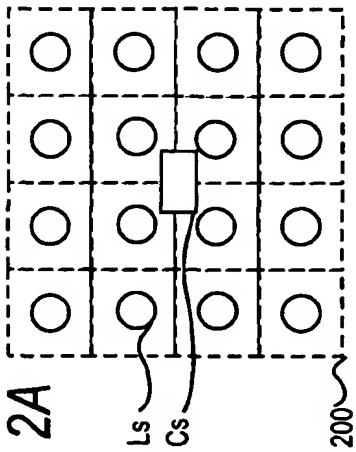

FIG. 2A

Document made available under the Patent Cooperation Treaty (PCT)

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